What is claimed is:

1. A semiconductor device comprising:

a gate dielectric film formed on a semiconductor substrate;

a gate electrode including:

a first electrode layer formed on the gate dielectric film;

a dielectric film having a thickness of 5 Å or more and 100 Å or less, and formed on the first electrode layer; and

a second electrode layer formed on the dielectric film; and

a source and drain regions formed in the semiconductor substrate at both sides of the gate electrode.

2. The semiconductor device according to claim 1, wherein the first and second electrode layers are formed of polycrystalline silicon or silicon germanium, to which an impurity is doped.

3. The semiconductor device according to claim 1, wherein the dielectric film is formed of a thermally oxidized layer or a natural oxide layer.

4. The semiconductor device according to claim 2, wherein the dielectric film is selected from the group consisting of a silicon oxide layer, a silicon nitride layer, a silicon oxynitride layer, and a combined layer formed by laminating at least two of a silicon oxide layer, a silicon nitride layer, and a silicon oxynitride layer.

5. The semiconductor device according to claim 1, wherein a thickness of the dielectric film is in a range of 0.5% to 10% of a thickness of the gate electrode.

6. The semiconductor device according to claim 1, wherein

the dielectric film is located within 500 Å from the gate dielectric film.

7. The semiconductor device according to claim 1, wherein the dielectric film is located at a height about 1/4 or less of a thickness of the gate electrode from the gate dielectric film.

8. A method of manufacturing a semiconductor device comprising:

forming a gate dielectric film on a semiconductor substrate;

forming a first electrode material layer on the gate dielectric film;

forming a dielectric film having a thickness of 5 Å or more and 100 Å or less on the first electrode material layer;

forming a second electrode material layer on the dielectric film;

forming a pattern on the second electrode material layer;

etching the second electrode material layer using the pattern as a mask, thereby exposing the dielectric film;

etching the dielectric film; and

etching the first electrode material layer, thereby forming a gate electrode.

9. The method of manufacturing a semiconductor device according to claim 8, wherein the second electrode material layer is formed of polycrystalline silicon or silicon germanium, to which an impurity is doped.

10. The method of manufacturing a semiconductor device according to claim 8, wherein the etching of the second electrode material layer to expose the dielectric film is performed by using HBr gas or a mixed gas containing HBr gas

and O_2 gas as an etching gas.

11. The method of manufacturing a semiconductor device according to claim 8, wherein the etching of the second electrode material layer includes:

etching the second electrode material layer using a first etching gas, and stopping etching before the dielectric film is exposed; and

etching the second electrode material layer using a second etching gas until the dielectric film is exposed.

12. The method of manufacturing a semiconductor device according to claim 11, wherein the first etching gas is one selected from the group consisting of HBr gas, a mixed gas containing HBr gas and Cl_2 gas, a mixed gas containing HBr gas, N_2 gas, and CF_4 gas, a mixed gas containing HBr gas, N_2 gas, and NF_3 gas, and a mixed gas containing HBr gas, N_2 gas, and CHF_3 gas.

13. The method of manufacturing a semiconductor device according to claim 11, wherein the second etching gas is one selected from the group consisting of HBr gas, a mixed gas containing HBr gas and O_2 gas, and a mixed gas containing HBr gas, Cl_2 gas, and O_2 gas.

14. The method of manufacturing a semiconductor device according to claim 8, wherein the dielectric film is selected from the group consisting of a silicon oxide layer, a silicon nitride layer, a silicon oxynitride layer, and a combined layer formed by laminating at least two of a silicon oxide layer, a silicon nitride layer, and a silicon oxynitride layer.

15. The method of manufacturing a semiconductor device according to claim 14, wherein a third etching gas used to etch the dielectric film is one selected from the group

consisting of CF_4 gas, SF_6 gas, NF_3 gas, and CHF_3 gas.

16. The method of manufacturing a semiconductor device according to claim 8, wherein the first electrode material layer is formed of polycrystalline silicon or silicon germanium, to which an impurity is doped.

17. The method of manufacturing a semiconductor device according to claim 8, wherein the etching of the first electrode material layer includes:

etching the first electrode material layer using a fourth etching gas until the gate dielectric film is exposed; and

removing a residue of the first electrode material layer using a fifth etching gas.

18. The method of manufacturing a semiconductor device according to claim 17, wherein the fourth etching gas is one selected from the group consisting of HBr gas, a mixed gas containing HBr gas and O_2 gas, and a mixed gas containing HBr gas, Cl_2 gas, and O_2 gas.

19. The method of manufacturing a semiconductor device according to claim 17, wherein the fifth etching gas is one selected from the group consisting of a mixed gas containing HBr gas and O_2 gas, a mixed gas containing HBr gas, O_2 gas, and N_2 gas, and a mixed gas containing HBr gas, Cl_2 gas, and O_2 gas.

20. The method of manufacturing a semiconductor device according to claim 8, further comprising removing a natural oxide layer formed on a surface of the second electrode material layer before the etching of the second electrode material layer.